DALIG NATIONAL HIGH SCHOOL
TLE GRADE 8 – PLUMBING
QUARTER 4
WEEKS 1-4

WEEK 1

LO 1. Prepare plumbing materials and tools for the task (TLE_IAPB7 /8UT-0a-1)
1.1 Prepare a list of plumbing tools and materials for a specific job

LEARNING TASK 1

A. Direction: Identify the following tools used in plumbing. Select your answer from the box and write on your answer sheet.

BENCH VISE	HACK SAW	PIPE WRENCH	PULL PUSH RULE	PIPE VISE	CLAMPS

1._____ 2. _____ 3. _____ 4. _____ 5. _____

B. Direction: Identify the following materials used in plumbing. Select your answer from the box and write on your answer sheet.

ABS CLEANER AND CEMENT	PREVENTS BLOCK THE DRAIN	MSS
IMMEDIATELY	SOLVENT	TEFLON TAPE

6. What is an adhesive material usually used externally?
7. _____is an adhesive material used by a plumber when working with ABS pipes.
8. Which refers to Manufacturer's Standardization Society?
9. Observing water outlets and drains _____.
10. When an improper installation of plumbing fixtures occurs, how soon should it be repair?

C.Direction: Fill in the blank. Select your answer from the box and write in your answer sheet

TOOL KEEPER	UNIT PRICE	FOREMAN
BORROWER	BALANCE ON HAND	LENGTH

11. _____ a person responsible in the overall operation of the worker in the Workplace.
12. _____ the one who is responsible to take care the of the tool room.
13. _____ name and signature of the person requesting tools and materials
14. _____ price of material per piece or per unit.
15. _____. refers to how long an object is.

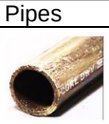
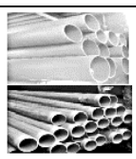
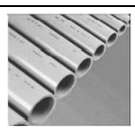
LESSON: PLUMBING MATERIALS AND TOOLS

Plumbing - is defined as the art and science of installing pipes, fixtures and other apparatus to convey and supply water in building and to dispose and discharge wastewater and other liquids, gases and other substances out of buildings in a safe, orderly, healthy and sanitary way to ensure the health and sanitation of life and property.

PLUMBER – is a title given to a person who is skilled in the field of sanitation.

I. PLUMBING MATERIALS
Material - is the stuff from which a thing is made of or consisting of matter.
Pipe - is a cylindrical conduit or conductor conforming to the particular dimensions commonly known as "pipe size" and is denoted by its interior diameter or I.D.

The most popular and commonly used kinds of pipes:
1. PLASTIC PIPE – is lightweight, flexible, durable, and versatile. Products are made of plastics and composite materials and are used in many of the same applications as traditional metal and ceramic piping.
Characteristics: -Low Initial Cost -Ease of Assembly -Lightweight, Corrosion Resistant -Low friction loss -Maintenance free.

Types of Plastic Pipes	Uses	Size availability
1. ABS (Acrylonitrite-But  ne)	– Sanitary Drainage – Vent Piping – Storm Water Drainage	-11/4- 6 inch diameter – 10 ft. or
`2. PVC (Polyvinyl Chloride) 	– Cold water lines – Drains – Irrigation	-1/2" to 4" diameter
3. CPVC (Chlorinated Polyvinyl Chloride) 	– Cold and hot water lines – High temperature and pressure lines	-1/2" ND 3/4" diameter` – 10 ft. lengths
4. PE (Polyethelyne)	– Underground water service	- 3/4 to 2" diameter – 100 ft. coils

5. Polypropylene Randon(PPR)	-for hot and cold piping system.	- 1-/2" to 2" -thickness 3.4 mm to 10.6 mm

2. STEEL PIPE – comprises of a variety of alloys with chromium content from 12 to 30 per cent, which protects it as long as the localized concentration is in excess of 12 per cent.

Types of Steel Pipes	Uses	Size availability
1. MALLEABLE IRON PIPE Characteristic: – strong, susceptible to rust and corrosion, difficult to install	– drain pipes – hot and cold water supply	– 1/2" to 12" diameter – 21' lengths- cut pipe available
2. CAST IRON PIPE - heavy metal made of casting on molds, covered with a porcelain enamel coating.	– sanitary and storm drain - sink, tubs, and lavatories – waste and vent piping applications	– 11/2" to 12" diameter – 5' AND 10' lengths
3. Galvanized Steel Pipe- made out from mild steel, drawn through a die and welded, cast into 6.0 meters long.	- Hot and cold water supply	- 1/2" to 2" diameter - 20'

COMMON MATERIALS

SOLVENT is an adhesive material usually used externally		FAUCET -is a point of installation system where flow of water or gas could be manipulated.	
TEFLON TAPE -is specifically used for attachment threaded pipe on fittings.		ADAPTOR/ADAPTER - is fittings that joints two different types of pipes together, such as ABS to cast iron or threaded to non- threaded.	
ABS CLEANER AND CEMENT -is an adhesive material used by a plumbean when working with ABS pipes.		ADAPTOR/ADAPTER - is fittings that joints two different types of pipes together, such as ABS to cast iron or threaded to non- threaded.	

3. FITTINGS – are any pipe part used to join two sections of pipes.
CHARACTERISTICS OF STAINLESS STEEL PIPE FITTINGS -is an alloy based on iron, which combines together the mechanical properties of steels and some specific features of corrosion resistance.

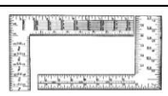
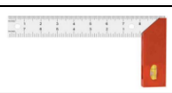
TYPES OF FITTINGS

Copper Supply		Galvanized supply		Plastic supply	

FIXTURES
Plumbing Fixture – are installed receptacles, devices, or appliances which are supplied with water, or which receives, or discharges liquid or liquid borne waste, with or without discharge into drainage system which maybe directly or indirectly connected.

Bathtub	Urinal	Shower	Lavatory/wash basin
Kitchen Sink	Water closet	Floor Drain	Traps and Vents

PLUMBING TOOLS
Tools - are anything which is held by hands and assists a person to do manual work.

COMMON MEASURING TOOLS - are hand tools for quantifying length, distance, height, diameter, etc.	USES
L-Square / Steel Square 	- to measure a work piece and is usually used as a normal rule
Try Square 	- an implement used to check and mark right angles in construction work
Pull-Push Rule	- Commonly used for measuring distance of cuts, fittings, and other accessories.

COMMON CUTTING TOOLS - are hand tools for dividing one piece of metal into two or more elements.	USES
Hacksaw	- used to cut all kinds of pipes and metals
Cross-Cut Saw	- to cut pieces of wood into different shapes.
Pipe Reamer	- for beveling or removing burrs from pipe ends
Pipe Cutter	- to cut pipe.
Pipe Threader	- is a device used to cut grooves or threads into the end of a metal pipe.

BORING TOOLS – a tool used to enlarge the hole that has already been drilled or cast.	USES
Electric Drill	- a device used to make a hole features an electric motor that rotates a drill bit.

TESTING TOOLS - used in finding out how well the finished work	USES
Spirit Level	- is used to set drain lines to the correct slope
Plumb Bob	- to establish a vertical line.
Horse Level	

DRIVING TOOLS- are hand tools used to keep materials in place while performing work.	USES
Sledge Hammer	– is a tool with a large, flat, often metal head, attached to a long handle.
Crowbar	- used as a lever.
Claw Hammer	- pounding nails into, or extracting nails from, some other object.
Screwdriver	- screwing and unscrewing screws by turning the handle.

Holding Tools - are hand tools used to keep materials in place while performing work.	USES
Adjustable Wrench	USES Adjustable Wrench - with different sizes of fastener head (nut, bolt, etc.) rather than just one fastener size, as with a conventional fixed spanner.
C-Clamp	- to hold a wood or metal work piece, and often used in, but are not limited to, carpentry and welding.
Bench Vise	- to hold metal or wood and are mounted to a table or workbench.

Pipe Vise	- to eliminate the hassle of using two pipe wrenches to assemble piping and fittings.
Pipe Wrench	- for turning soft iron pipes fittings with a rounded surface.
Pliers	- holding, bending and compressing a wide range of materials.

LO 2**. Request appropriate plumbing supplies, materials and tools applicable to a specific job**. TLE_IAPB7 /8UT-0a-2
1.1 Use the appropriate form in requesting for plumbing tools, supplies and materials for a specific job

LESSON: REQUISITION OF MATERIALS AND TOOLS

Requisition Slip – is a request for materials made to the person that is responsible for supplies.
Name of the Project – a task in which the materials will be used.
Balance On Hand - the quantity of materials available in the stockroom.
Requisition Quantity and unit - a number and units of materials requested.
Unit – a measuring quantity.
Material/ Description – the name of material and description or specification (e.g. PVC Pipe 12mm x 3m).
Unit Price - a price per unit or per piece.
Total - is a whole or complete amount of item. (ex. 9pcs x P386 = P3, 474.00)
Foreman - a person responsible in the overall operation of the worker in the workplace
Borrower's slip - used in borrowing something that can be used in a specific job.
Tool Keeper - the one who is responsible to take care the of the tool room.
Job Order - workings sheet that server as a complete guide of the student to a certain task to be done.
Material Officer - a person responsible in the release and retrieve of excess materials.
Lead man - is a person that leads the group in the specific task.

Sample Request for materials and tools needed for a specific job:

A. Requisition Slip

Name of School: Aloran Trade High School
Address: Aloran

Plumbing Shop
Requisition Slip

NAME OF PROJECT: Plumbing Workshop Lavatory **DATE:** July 10, 2020
Purpose: Repair Defective Plumbing Fixture **Group**: G - 7

Balance on Hand	Quantity	Unit	Materials and Description	Unit Price	Total
1 pc.	9	Pcs.	Plier Steel 3/8"x7/8" wide	386.00	3,474.00
2 pcs.	8	Pcs.	Pipe Wrench alloy steel	320.00	2,560.00
3 pcs.	7	Pcs.	Screw Driver chrome plated vanadium steel 6"	135.00	945.00
TOTAL					**6,979.00**

Requested by:

_____
Student's Name

Approved:

_____
Foreman

_____
Shop Teacher

REQUISITION PROCEDURE

REQUISITION PROCEDURE

In making a request for materials and tools needed, the following Standard Operating Procedure (SOP) should be followed:

1. List down the materials and tools needed as per job requirement.
2. Check for the availability of the needed materials and tools in the stockroom.
3. Accomplish a requisition form
4. Let the shop teacher check the requisition form.
5. Submit the requisition form to the material officer
6. Unavailable requested materials and tools should be substituted without sacrificing the cost and quality of work
7. The material officer will prepare the requested material for issuance to the student.

Sample Borrower's Slip:

B. Borrower's Slip No. 0023

Plumbing Shop
Borrower's Slip

Date: July 15, 2020

Item No.	No. of Pc	Name and Description of Tools	Remarks
1.	2	Plier Steel 3/8"x7/8" wide	Functional
2.	1	Pipe Wrench alloy steel	Functional
3.	3	Screw Driver chrome plated vanadium steel 6"	Functional

Approved by:

Gino Lamar
Tool Keeper

Devina Gracia
Borrower

John Tan
Foreman

Ben Lastimoso
Shop Teacher

LEARNING TASK 2

A. FILL IN THE BLANK: Identify the materials and tools. Select your answer from the box and write on your answer sheet.

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HACKSAW	PIPE CUTTER	PE PIPE	SOLVENT	FAUCET
PVC PIPE	TEFLON TAPE	CLAW HAMMER	FITTING	TRY SQUARE

1. Used to cut all kinds of pipes and metals is _____.
2. _____ is a tool used for cutting pipe and tube.
3. _____ refers to Poly Vinyl Chloride material.
4. _____ is Polyethylene Plastic material intended for long span water sanitary installation.
5. _____ an adhesive material usually used externally.
6. _____ specifically used for attachment threaded pipe on fittings.
7. _____ runs in different forms that are intended for plumbing joints and connection.
8. _____ a points of installation system where flow of water or gas could be manipulated.
9. _____ is a tool primarily used for pounding nails.
10. _____ an implemented used to check and mark right angles in construction work.

B. True or False: Write **T** if the statement is true. Write **F** if the statement is false. Write your answer in your answer sheet.

11. A form used to borrow the materials and tools for a specific job is Borrower's slip.
12. The Item no. is in the first column of the Borrower's slip.
13. Shop Teacher will approve the Requisition slip.
14. A Tool Keeper will approve the Borrower's slip.
15. Lead man is a person responsible in the overall operation of the worker in the workplace.

PERFORMANCE TASK 1

A. Directions: Complete the table. What material and/or tool is being asked.

TASK	MATERIALS	TOOLS
Cut PVC pipe	1.	2.
Cut grooves or threads into the end of a metal pipe.	3.	4.
Screwing and unscrewing screws by turning the handle.	Screw with cross slot at the head	5.
Holding, bending and compressing G.I. pipe	6.	7.
Join two different types of pipes together,	8.	9.
Turn soft iron pipes fittings with a rounded surface	G.I. pipe	10.
Establish a vertical line.	4" dia PVC pipe	11.
Set drain lines to the correct slope	6" dia PVC pipe	12.
Beveling or removing burrs from pipe ends.	½" dia G.I. pipe	13.
Install cold water line	14.	Hack saw
Install underground water service	15.	Hack saw

B. Direction: Given the necessary data in a requisition slip, fill up the missing data needed for the workshop for a replacement of a broken P-trap.

Name of School: (1. ?)_____
Address: (2. ?)_____

Plumbing Shop
Requisition Slip

NAME OF PROJECT: Plumbing Workshop Lavatory **DATE:** (3.?)__
Purpose: Replacement of a broken P-trap **Group**: G - 7

Balance on Hand	Quantity	Unit	Materials and Description	Unit Price	Total
1 pc.	1	Pcs.	PVC Solvent (500 ml.)	350.00	(4.?)
1 pc.	5	Pcs.	PVC P-trap (2")	(5. ?)	325.00
TOTAL					**P 675.00**

WEEK 2

LO 1. Select plumbing measuring tools and instruments (LE_IAPB7 /8MC-0c-1)
1.1 Choose measuring tools to be used for specific tasks

LEARNING TASK 3: Pre -Test

A. Match the definition in Column **A** with the term in Column **B**. Write the letter of the best answer.

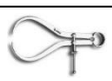
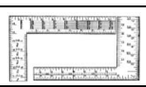
COLUMN A	COLUMN B

1. A tool used to measure the outside diameter of a pipe. 2. A tool which is made up of steel having divisions in metric system used for layout. 3. A measuring tools used to measure the inside diameters or width of pipe and slots. 4. A tool intended to measure the angle, if necessary. 5. A tool used to measure the length of a pipe.	A. Outside Calliper B. L-Square C. Pull Push Rule D. Try Square E. Inside Calliper

B. Direction: Answer the following questions. Write your answer on your answer sheet.
6. How many feet are there in 5 meters?
7. How many meters are there in 15 feet?
8. How many inches are there in 75 meters?
9. How many centimeters are there in 100 inches?
10. How many inches are there in 8 meters?

Select Plumbing measuring tools and instruments

Definition of Terms
Accuracy -means correctness, exactness, precision.
Area -is any of space especially of ground or surface that is distinguishable from its surrounding in appearance or in certain distinctive features
Clearance - is the space, allowance or gap between working part of an object.
English System -is the old way of measurement that replaced the metric system.
Height -may be used with reference whether high or low by a standard of companion.
Instrument - is a device that measures or controls something.
Length - refers to how long an object is
Measurement - refers to the size, length, quantity or rate of something that has been measured.
Mensurations -the calculation of geometric quantities such as length, area and volume from dimensions and angles that are already known.
Metric System -is the System of measurement which uses 10 as its multiple in all its conversion is it in distance, volume, weight etc.
Pressure - is the force acting on a surface divided by the area over which it acts.
Volume -refers to the magnitude size intent, dimension, areas, and bulk, mass the total amount of something.
Weight -refers to the total quality of heaviness and things determined by their mass or control acts efforts to lift or move them.

MEASURING TOOLS AND INSTRUMENTS	USES	Proper handling
Inside Caliper	- to measure the internal size of an object.	Rotate the screw to measure holes and diameters. Avoid using tip to open the cover of any can. Avoid dropping to maintain its accuracy.
Outside Caliper 	- to measure the external size of an object.	Measures the external size of an object.
Steel Square 	- as the framing square	Holds firmly and cautiously and don't drop. It has a sharp pointed end and dangerous.
TRY SQUARE	- for marking/ measuring a piece of wood	Hold properly to maintain its straight edges to get the desired angle.
PULL PUSH RULE (Tape Measure)	- for measuring distance of cuts, fittings, and other accessories.	Hold the tip when removing it from its housing. Put it slowly to avoid cut from the steel tape.
Spirit Level	- to set drain lines to the correct slope	Hold the tip when removing it from its housing. Put it slowly to avoid cut from the steel tape.
Plumb Bob	- to establish a vertical line	Hang the string to get the straight vertical line.

LO 2. Carry out measurements and calculations (TLE_IAPB7 /8MC-0d-2)
2.1 Use appropriate measuring devices for specific tasks.

LESSON: LINEAR MEASUREMENT

English System – a weights and measures in length and weight and duration based on the foot and pound and second and pint.
Metric System - a system that based on the fundamental units in meter, kilogram and second.

CONVERSION OF UNITS
1 meter = 3.28 feet
1 meter = 39.37 inches
1 meter = 1000 millimeters
1 meter = 100 centimeters
1 centimeters = 10 millimeters
1 foot = 12 inches
1 inch = 2.54 centimeters

ENGLISH FRACTIONAL (INCH)	ENGLISH DECIMAL (INCH)	ENGLISH (MILLIMETER)
1/16	0.0625	1.6
1/8	0.125	3.2
¼	0.25	6.4
3/8	0.375	9.8
½	0.50	12.7
5/8	0.625	16.0
¾	0.75	19.1
7/8	0.875	22.2
1	1.0	25.4

Unit of Measure:
a. Inch (“) - Equal to one-twelfth of a foot (1/12) or one thirty-sixth of a yard (1/36 yard)
b. Foot („) - Equal to twelve inches (12”) or one-third of a yard (1/3 yard)
c. Yard - Equal to three feet (3“) or thirty-six inches (36”)
d. Rod - Equal to sixteen and one-half feet (161/2)
e. Mile - Equal to five thousand, two hundred and eighty feet (5280“)

Sample Conversion:

A. English to Metric System

1) $5 \text{ inches} \times \frac{2.54 \text{ cm}}{1 \text{ inch}} = 12.7 \text{ cm}$

2) $20 \text{ cm} \times \frac{1 \text{ inch}}{2.54 \text{ cm}} = 7.87 \text{ inch}$

B. Unit in Metric System

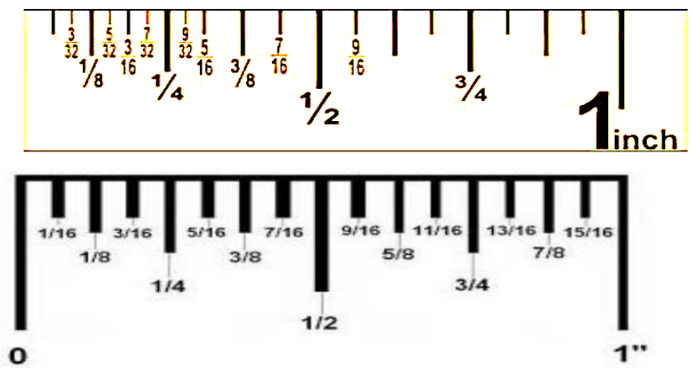
3) $105 \text{ mm} \times \frac{1 \text{ cm}}{\text{Mm}} \times \frac{1 \text{ dm}}{10 \text{ cm}} = 10.5 \text{ dm}$

C. Unit in English System

4) $25 \text{ inch} \times \frac{1 \text{ ft}}{15 \text{ inch}} \times \frac{1 \text{ yard}}{3 \text{ ft}} = 0.56 \text{ yards}$

Graduation of a Rule

INCH



CENTIMETER

LEARNING TASK 4
A. Directions: Identify the following:
1. _____ used to measure the internal size of an object.
2. _____ used to check and mark right angles in construction work
3. _____ used to measure a work piece and is usually used as a normal rule.
4. _____ used to set drain lines to the correct slope.
5. _____ used to establish a vertical line.

B. Solve the following problems. Write your answer in your answer sheet.
6. 25 m = _____ feet
7. 35 feet = _____ m
8. 50 cm = _____ inch
9. 75 inches = _____ cm
10. 5 m = _____ inch5.

PERFORMANCE TASK 2
A. Illustration. Directions: Draw the appropriate measuring tool/ instrument for the following task:

TASK	Measuring tools/ Instrument
Measuring the internal size of a G.I. pipe	1.
Establishing a vertical alignment of a vent pipe	2.
Measuring distance of cuts, and fittings	3.
Setting the drain line’s slope	4.
Measuring the external size of a tube.	5.

B. Solve the following problems.
6. 50 m = _____ mm
7. 20 mm = _____ m
8. 300 inch = _____ m
9. 500 cm = _____ m
10. 3 m = _____ inch

WEEK 3

LO 1. Analyze signs, plumbing symbols and data (LE_IAPB7 /8ID-0e-1)
1.1 Read and interpret plumbing signs, symbols and data
1.2 Analyze plumbing components and materials based on signs, symbols and data,

LO 2. Interpret technical drawings and plans (LE_IAPB7 /8ID-0f-2)
1.1 Read blueprints of plumbing plans, diagrams and circuits 1.2 Identify necessary tools, materials and equipment according to blueprints of plumbing plans, diagrams and circuits

LEARNING TASK 5 PRE-TEST

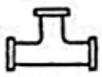
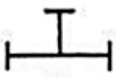
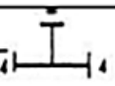
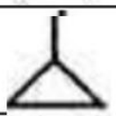
A. Identify the following. Select from the box and write the answer on your answer sheet.

90 deg ELBOW	STRAIGHT TEE	SHOWER HEAD	LAVATORY	WATER CLOSET
WATER METER	COLD WATER LINE	HOT WATER LINE	VENT LINE	GATE VALVE

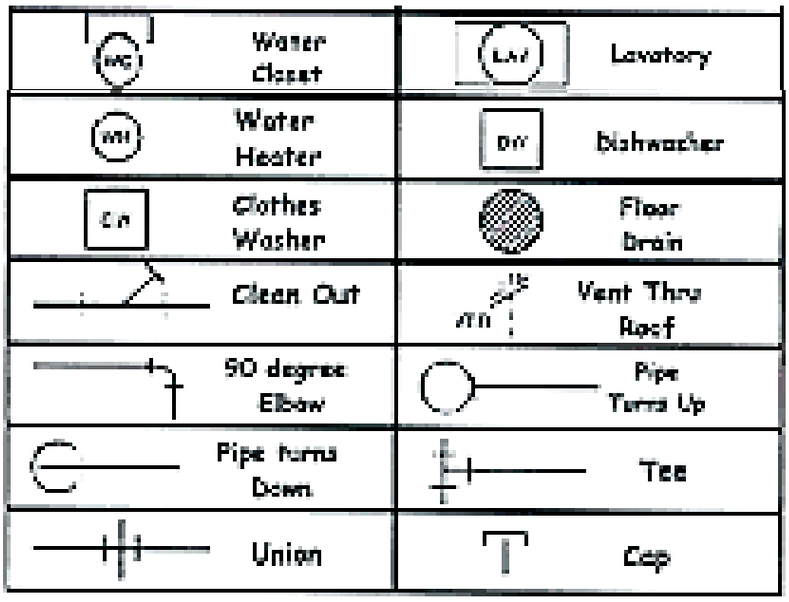
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

LESSON: COMMON PLUMBING SYMBOLS

PLUMBING PARTS AND FITTINGS WITH SYMBOLS

PLUMBING PARTS	ILUSTRATED	SYMBOLS (THREADED)
90° ELBOWS – to change the direction in piping.		
STRAIGHT TEE – a branch outlet has a 90° direction turning from the main pipe to tee.		
REDUCING TEE –T-shaped with two outlets that cut at **90°**		
SANITARY TEE – allows liquid to drain while also allowing the plumbing system vent .		
P-TRAP – a trap with a vertical inlet and a horizontal outlet.		
GATE VALVE – controls the extent of the aperture with a sliding part.		
SHOWER HEAD – for directing the spray of water in a bathroom shower.		
LAVATORY (SINKS) – fixed bowl or basin with running water and drainpipe.		
BATH TUBS – a tub to bath in, especially one that is a permanent fixture in a bathroom.		
SHOWER STALL – compartment or self-contained unit, having a single shower and accommodating one person.		

	Water Meter		Cold Water
	Hot Water		Vent Line
	Sanitary Waste		Gas Pipe
	Gate Valve		Water Heater Shut Off



LEARNING TASK 6.
A. Directions: Identify the following plumbing parts.

1.
2.
3.
4.
5.

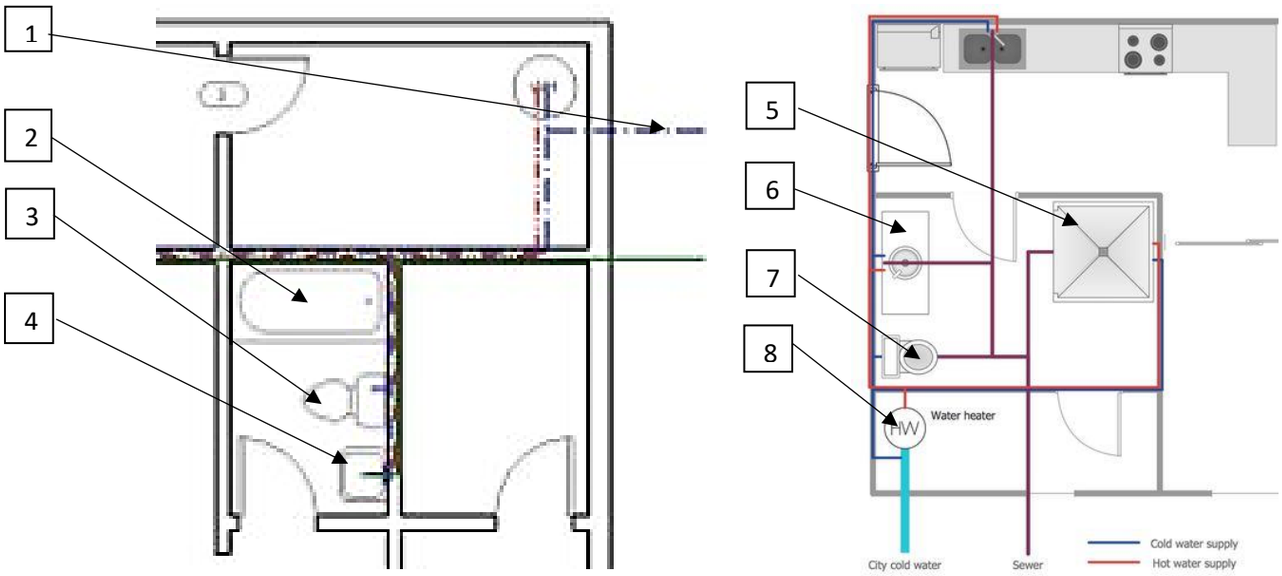
B. Directions: Match Column A with Column B. Write the letter only.

A	B
6. To change the direction in piping.	A. VENT PIPE
7. A tub to bath in, especially one that is a permanent fixture in a bathroom.	B. SANITARY TEE
8. A pipe used above a waste pipe or soil pipe that allows gas to escape from the system	C. BATHTUBS
9. Compartment or self-contained unit, having a single shower and accommodating one person.	D. 90° ELBOWS
10. Allows liquid to drain while also allowing the plumbing system vent.	E. SHOWER STALL

LINE SYMBOLS:

	Drain Pipe – a pipe used for drainage.
	Soil pipe – a pipe for carrying off wastes from toilet to septic tank.
	Vent pipe – a pipe used above a waste pipe or soil pipe that allows gas to escape from the system.
	Cold water line – a pipe installed in a building for the distribution of potable water and removal of water borne wastes.
	Hot water line – carries the heated water to all the fixtures, fixtures, out-lets, and appliances that require hot water.
	Property line – the boundary line between two pieces of property.
	Clean out – an instance of thoroughly cleaning the inside of something.

PERFORMANCE TASK 3
Directions: Identify the plumbing fixtures indicated by arrows. (1 – 8)



9. Draw the symbol for faucet
10. Draw the symbol for shower head

WEEK 4

LO 2. Perform basic preventive maintenance
1.1 Maintenance of tools is done regularly

LO 3. Store tools and equipment
1.1 Tools are stored safely in appropriate locations in accordance with manufacturer specifications or standard operating procedure

LEARNING TASK 7. PRE-TEST
Directions: Write **TRUE** if the statement/ phrase is correct, and **FALSE** if it is wrong.

1. Vegetable oil is primarily triglyceride esters derived from plants and animals.
2. Water can also be used on its own or as a major component with one of the other base oils.
3. Lubricant reduces friction.
4. Lubricants transfer heat.
5. Inventory is not a detailed list of all the items in stock.

LESSON: LUBRICANTS

Before using the tools and equipment in the installation of pipes, you have to know first the types of lubricants to be used. In this manner, you can prevent rusting and malfunctioning of the tools and equipment. There are four types of lubricants, and these are liquid including emulsion and suspension, solid, grease, and paste.

- Liquid lubricants – are known as lanolin natural water repellent. Lanolin which is derived from wool grease and is a safe alternative to the more common petrochemical based lubricants. These lubricants are also preventive agents against inhibitors such as rust, salt and acids.
- Water can also be used on its own or as a major component with one of the other base oils.
- Mineral oil is used to encompass lubricating base oil derived from crude oil.
- Vegetable oil is primarily triglyceride esters derived from plants and animals.

Purpose of Lubricating Here are the advantages of lubricating the tools and equipment:

- Keeps moving parts apart.
- Reduces friction.
- Protects against wear.
- Carries away contaminant and debris
- Transmits power
- Transfers heat.
- Prevents corrosion.

LESSON: STORE TOOLS AND EQUIPMENT

Tools and Equipment Inventory

Some companies often spend more time in tracking and managing their inventory. Others --- such as manufacturers, producers and construction companies --- may use specific equipment for specific jobs. This creates a difficult situation of attempting to manage inventory at multiple job locations. Business owners and managers typically create systems or processes that employees must follow when using the company's shop tools.

Depending on the type of company, owners or managers may require employees to use own tools for certain jobs. For example, construction companies may require employees to have their own items such as a hammer, painting equipment or welding supplies. This reduces inventory management.

Whatever is the type of company or shop, inventory taking is very important. On this context**, inventory** is defined as a detailed list of all the items in stock.

Reason for Maintaining Tools and Equipment Inventory

The most important point to consider is to purchase top-grade tools. They must be made of high-quality steel and manufactured for precision. Special consideration is given to balance so that the tool/equipment will be properly maintained and prevent loses. Since the technician must work with his tools daily, regular inventory of tools/equipment is very important.

The initial cost of a minimum number of tools is high but there is accompanying warranty guarantees satisfaction and many years of service. It is better, in the long run, to start with a few carefully selected tools that will take care of your most common needs and then gradually build-up to a complete set. It is sometimes hard to identify and memorize the huge number of tools and equipment in the workshop, maintaining the inventory record is of great value.

Points to Consider

- Create a sign out sheet for all shop tools. Companies can use a sign out sheet where employees must fill up with specific information relating to the inventory item and specific job use. This allows business owners and managers to know where each tool is located at all times.
- Conduct an audit for long-term jobs. Shop tools left at working place for long periods may require a manager to verify that the tool is still on the job site. A manager can visit the site unannounced and review the sign out sheet against all tools on the job.
- Restrict shop tool access to one individual. This allows companies to have one person on each job responsible for checking out, or in, various shop tools. Companies can require this individual to be a manager or foreman.
- Use a barcode system to track inventory. Companies can place barcode labels on each shop tool and require employees to electronically scan each tool when using them at different job sites. This creates an electronic record and can allow real-time reporting of tool use

LEARNING TASK 8

Directions: Fill in the blanks with appropriate words.

1. Liquid lubricants are known as lanolin natural _____ repellent.
2. Mineral oil is used to encompass lubricating base oil derived from _____ oil.
3. Lubricant keeps moving _____ apart.
4. Lubricants protects against _____.
5. Restrict shop tool access to one _____.

PERFORMANCE TASK 4

Essay. Briefly discuss the following considerations in maintaining and storing tools and equipment.

1. Create a sign out sheet for all shop tools (20 pts)
2. Conduct an audit for long-term jobs. (20 pts)
3. Restrict shop tool access to one individual. (20 pts)

Criteria:

Content_____ 10 pts
Organization of ideas ____ 10 pts

REFERENCES:

1. Technology and Livelihood Education, Plumbing Grade 7/8, ADM, Department of Education
2. K to 12 Basic Education Curriculum, Technology and Livelihood Education, Learning Module, Plumbing, Exploratory Course Grade 7 And Grade 8

Edited By :

Reniel D San Juan
Sheryl R. Victorio
Jenelyn L. Tuazon

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